

TRANSLATION FOR TW470193

Abstract

A touchpad device installed on a notebook computer, for moving a cursor on a screen, is provided. The touchpad device includes a touchpad, capable of moving the cursor on the screen through a relative coordinate method as the touchpad is touched by a user's finger. A protruberance is provided beneath the touchpad. In addition, a switch button is installed on a printed circuit board and located beneath the touchpad. When the touchpad is pressed by the user, the protruberance presses the switch button and activates the function of a circuit on the printed circuit board, so that a relation of absolute coordinate exists between the touchpad and the cursor on the screen. The cursor on the screen jumps to a corresponding position when the user touches any part of the touchpad.

Touchpad Device of Digital Electronic Product

Background of the Invention

Field of the Invention

The present invention relates to a touchpad device installed on an electronic product, and more particularly to a touchpad device installed on a notebook computer, for controlling a cursor on a screen through relative coordinate and absolute coordinate methods as the touchpad of the notebook computer is touched by a user.

Description of the Prior Art

In consideration of convenience and practicability, recent electronic products have followed a trend of being light, thin, short, and small. The notebook computer is quite a typical example, and others, for example, a portable scanner, portable radio recorder, even the recently and extremely popular personal digital assistant (PDA), or an electronic dictionary, etc. are favored and widely used in society because of their ability to process a great deal of digital information.

Referring to FIG. 1, a recently and widely used notebook computer 10 is shown. As is known, the notebook computer 10 has an upper cover 12 connected to a host part 18. The upper cover 12 has a screen 14, and the host part 18 has a keyboard part 16 on a surface thereof, so that it is convenient to perform an input action, etc., and thus perform the operation function. It should be noted that in order to satisfy the portable characteristic of the notebook computer, related accessories used by a conventional desktop computer, such as a keyboard, mouse, or modem, are installed in the notebook computer in suitable manners. For example, in the common notebook computer 10, usually the purpose of controlling a cursor on the screen is achieved by using a touchpad 20 instead of the mouse.

However, when using the notebook computer, those used to using a desktop computer usually are not adapted to the method of moving the cursor on the screen by touching the touchpad 20 by a finger. The main reason is that the proportion between the moves distance that the user's finger is moved and the distance that the cursor on the screen is quite large. That is, when the cursor on the screen 14 is controlled through the touchpad 20, the sensitivity is quite high. Therefore, when he intends to move the cursor a small distance on the screen 14, the user's finger can only

touch the touchpad 20 and slightly move; otherwise, the cursor will move on the screen too much. However, in order to enable the user to control the cursor on the screen at his/her pleasure, the sensitivity of the cursor on the screen is reduced (that, is the corresponding proportion between the touchpad and the cursor on the screen is reduced), and when the user intends to move the cursor on the screen a larger distance, usually it is necessary to touch the touchpad 20, and move the finger back and forth several times before the cursor achieves the destination. Therefore, even if the user is accustomed to using the notebook computer, the relative coordinate manner, in which the user touches the touchpad 20 and slides thereon, and then drives the cursor on the screen to move a corresponding distance according to a fixed proportion, still results in inconvenience to a certain degree.

Summary of the Invention

The present invention is mainly directed to a touchpad device using an absolute coordinate method, where a cursor on a screen immediately jumps to a corresponding position according to the position at which a user presses the touchpad.

The present invention is further directed to a touchpad device capable of changing a relation between the touchpad and the cursor on the screen once the touchpad is pressed.

The present invention provides a touchpad device installed on a notebook computer, capable of moving the cursor on the screen through an absolute coordinate or relative coordinate method as the touchpad is touched by the user's finger. The touchpad device includes a touchpad, a flat plate, a window cover, and a switch button. The touchpad is connected to a main board of the notebook computer through a bus line. In addition, the flat plate is located beneath the touch pad in order to carry the touchpad, and a protruberance is provided on a rear surface of the flat plate, and four wedge openings are provided on edges of the flat plate. The window cover is installed above the touchpad, and exposes an upper surface of the touchpad. The window cover has four wedge hooks on edges, capable of respectively hooking the four wedge openings, so as to fix the touchpad between the window cover and the flat plate. In addition, the switch button is installed on a printed circuit board, beneath the flat plate, and right aligned with the protruberance on the rear surface of the flat plate. When the touchpad is pressed and falls, the flat plate falls accordingly, so that the protruberance presses the switch button and activates the function of the circuit on

the printed circuit board. In this manner, a relation of absolute coordinate exists between the touch point on the touch pad and the cursor on the screen. That is, when any part of the touchpad is touched, the cursor on the screen jumps to the corresponding position. Further, an elastic recovery device can be installed beneath the flat plate, so that when the pressure exerted on the touchpad disappears, the elastic recovery device can lift the flat plate upwards, so the protruberance leaves the switch button, and the function of the circuit on the printed circuit board is stopped; therefore, a relation of relative coordinate exists between the touch point on the touchpad and the cursor on the screen. That is, when the user touches the touchpad and moves his finger, the cursor on the screen moves proportionately.

Brief description of the drawings

The above content and the advantages of the present invention can be easily understood with the detailed description and the accompanying drawings:

FIG. 1 is a device view of a recently and widely used notebook computer;

FIG. 2 is a cross-sectional view of a touchpad device installed on the notebook computer according to the present invention, in which the touchpad is not pressed, and thus the switch button located on the circuit board is not pressed;

FIG. 3 shows that when the touchpad is not pressed in order to press the switch button, the cursor on the screen moves through a relative coordinate method as the touchpad is touched by a user's finger;

FIG. 4 is a cross-sectional view of the touchpad device installed on the notebook computer according to the present invention, in which the touchpad is pressed in order to press the switch button;

FIG. 5 shows that when the touchpad is pressed in order to press the switch button, the cursor on the screen moves through an absolute coordinate method as the touchpad is touched by the user's finger;

FIGS. 6A and 6B are exploded views of the touchpad device installed on the notebook computer according to an embodiment of the present invention; and

FIG. 7 is a cross-sectional view of the touchpad device installed on the notebook computer according to the present invention.

Detailed Description

The present invention provides a touchpad device capable of moving a cursor on a screen through absolute coordinate and relative coordinate methods by switching the method of controlling the cursor on the screen. By installing a protuberance beneath the touchpad, when the user presses the touchpad, the protuberance presses the switch button and activates the function of the circuit on a printed circuit board, thereby switching to the absolute coordinate method to control the cursor on the screen. The detailed description of the present invention is given as follows.

Firstly, referring to FIG. 2, a touchpad device installed on a notebook computer according to the present invention is shown. The touchpad 20 is embedded in a housing 19 of the host part of the notebook computer (see FIG. 1). As described above, the touchpad 20 controls the cursor on the screen through the relative coordinate method. That is, the cursor on the screen moves in a relative fixed proportion, sliding on the upper surface of the touchpad 20 as it is moved by the user's finger. It should be noted that a protuberance 21 is additionally installed on the rear surface of the touchpad 20, so that when the user presses the touchpad 20, it is possible to switch and control the relation between the touchpad 20 and the screen.

In addition, a printed circuit board 22 is provided and installed beneath the touchpad 20. The printed circuit board 22 is mainly used to switch the control relation between the touchpad 20 and the cursor on the screen, so that it can be switched between the relative coordinate and absolute coordinate methods. It should be noted that on the printed circuit board 22, a switch button 24 is installed and aligned with the position of the protuberance 21 of the touchpad 20. When the touchpad 20 is pressed by the user, the protuberance 21 presses the switch button 24, and activates the function of the circuit on the printed circuit board 22, so that a relation of absolute coordinate exists between the touchpad and the cursor on the screen. On the contrary, as shown in FIG. 2, when the user does not press the touchpad 20, the protuberance 21 will not press the switch button 24, and at this time, a relation of relative coordinate exists between the touchpad and the cursor on the screen.

Referring to FIG. 3, a situation in which the touchpad 20 and the cursor on the screen are controlled through a relative coordinate method is shown. When the user's finger touches the touchpad 20, and slides from point A to point B, the cursor on the screen moves in a suitable proportion, for example, moves from point A' to point B'. At this time, when the user's finger leaves the touchpad 20, and touches the

touchpad 20 again and slides from point C to point D, the cursor on the screen may move from point B' to point D in a suitable proportion. In other words, when the user intends to move the cursor on the screen again, it is possible to touch the touchpad 20 and move the cursor on the screen from point D' to the required destination.

However, as shown in FIG. 4, when the user intends to change from the relative coordinate method to the absolute coordinate method, the user may lightly press the touchpad 20, and the touchpad 20 is made to fall, so that the protruberance 21 beneath the touchpad 20 presses the switch button 24 on the printed circuit board 22 and activates the function of the circuit on the printed circuit board 22. At this time, the absolute coordinate relation exists between the cursor on the screen and the touchpad 20. That is, when the user touches any part of the touchpad, the cursor may immediately jump to the corresponding position on the screen. As shown in FIG. 5, when the user presses the touchpad 20 and the finger touches a point E in the upper left corner of the touchpad 20, the cursor on the screen may immediately jump to a corresponding E' in the upper left corner of the screen 14. When the user intends to move the cursor on the screen to a point F' the upper right corner of the screen 14, the purpose can be achieved by touching the point F' in the upper right corner of the touchpad 20 by the finger when pressing the touchpad 20. Similarly, no matter where the cursor is located on the screen 14, as long as a central point G of the touchpad 20 is pressed, the cursor on the screen immediately jumps to a central point G' of the screen. That is, when the cursor on the screen is controlled through the absolute coordinate method, any position on the screen can correspond to the same position on the touchpad 20, so as to easily achieve the requirement of moving the cursor on the screen to the destination.

Next, referring to FIG. 6A, an exploded view of the touchpad device installed on the notebook computer 10 according to the embodiment provided by the present invention is shown. The touchpad device includes the touchpad 20, and the touchpad 20 has a bus line 44 for connecting the touchpad 20 to the main board of the notebook computer 10. A flat plate 46 is provided beneath the touchpad 20 in order to carry the touchpad 20, in which four wedge openings 48 are respectively formed on edges of the flat plate 46, so as to fix the touchpad 20. It should be noted that, as shown in FIG. 6B, a protruberance 21 is provided on a rear surface of the flat plate 46, so that the user can switch the method of controlling the cursor on the screen.

Referring to FIG. 6A again, a window cover 40 is provided above the touchpad 20 to cover the edge portion of the touchpad 20 and expose an upper surface of the touchpad 20. The window cover 40 has four wedge hooks 42 on the edges, which respectively correspond to the four wedge openings 48 of the flat plate 46. When the two are hooked, the touchpad 20 can be fixed between the window cover 40 and flat plate 46. In addition, an elastic recovery device 50 is installed beneath the flat plate 46, so that when the pressure exerted on the touchpad 20 disappears, the elastic recovery device 50 lifts the flat plate 46 upwards, and the protruberance 21 leaves the switch button 24, and the function of the circuit on the printed circuit board 22 is stopped. The touch point on the touchpad 20 and the cursor on the screen recover the relation of relative coordinate. In a preferred embodiment, a bridge structure as shown in FIG. 6A can be used as the elastic recovery device 50, in which the bridge structure includes two intersecting thin plates 52, and is fixed by a spring pillar 54 passing through the two thin plates 52.

In this manner, the touchpad device as shown in FIG. 7 can be obtained. The touchpad 20 wrapped by the window cover 40 and the flat plate 46 can be installed on the housing 19 of the host part of the notebook computer 10. The bus line 44 connected to the touchpad 20 can be pulled from a gap of the front end of the flat plate and connected to the main board of the notebook computer 10. An elastic recovery device 50 of the bridge structure is installed between the flat plate 46 and printed circuit board 22. When the user intends to control the cursor on the screen through the absolute coordinate method, the touchpad 20 can be pressed, so that the protruberance 21 beneath the flat plate 46 is pressed onto the switch button 24, thereby activating the function of the circuit on the printed circuit board 22. On the contrary, when the user moves the cursor on the screen to the required position, as the touchpad 20 is released, the spring pillar 54 restores the bridge structure to its former shape, so that the flat plate 46 moves upwards, and the protruberance 21 leaves the switch button 24. In this manner, when the user does not press the touchpad 20, but touches and slides his finger on the touchpad 20, the cursor on the screen will move again in the relative coordinate method.

Therefore, the controlling method between the touchpad and the cursor on the screen is governed by pressing or releasing the touchpad, so as to greatly improve the capability of the user to control the cursor on the screen by using the touchpad. A user not accustomed to using the notebook computer can press the touchpad, and then

the cursor on the screen is moved through the absolute coordinate method, so after the cursor is moved to the probable position on the screen, the touchpad is released, and the cursor on the screen is moved through the relative coordinate method. In particular, the cursor can directly jump to the required position through the absolute coordinate method, so when the proportion of the relative coordinate is designed, the proportion between the touchpad and the cursor on the screen can be reduced. That is, the sensitivity of the cursor on the screen can be reduced, so that when the user controls the cursor on the screen by touching the touchpad, it is possible to move the cursor on the screen to the destination position more freely. In addition, it should be particularly illustrated that in the embodiment of the present invention, although the notebook computer is exemplified, those skilled in the art should know that the sliding mechanism can be applied to any digital electronic product, for example, it can be applied to a PDA, an electronic dictionary, and other products.

It will be apparent to those skilled in the art that various modifications and variations can be made to the structure of the present invention without departing from the scope or spirit of the invention. In view of the foregoing, it is intended that the present invention cover modifications and variations of this invention, provided that they fall within the scope of the following claims and their equivalents.

List of Reference Numerals

- 10 Notebook computer
- 12 Upper cover
- 14 Screen
- 16 Keyboard
- 18 Host part
- 19 Upper cover
- 20 Touchpad
- 21 Protruberance
- 22 Printed circuit board
- 24 Switch button
- 40 Window cover
- 42 Wedge hook
- 44 Bus line
- 46 Flat plate

- 45 Wedge opening
- 50 Elastic recovery device
- 52 Thin plate
- 54 Spring pillar

We Claim:

1. A touchpad device installed on an electronic product for processing digital information, capable of moving a cursor on a screen when the touchpad is touched, at least comprising:

a touchpad, located on the electronic product, capable of moving the cursor on the screen through the relative coordinate method as the touching is touched the touchpad by a user's finger and the finger is moved thereon, wherein a protruberance is on a rear surface of the touchpad, and

a switch button, installed on a printed circuit board, beneath the touchpad, and aligned with the protruberance of the touchpad, wherein the protruberance presses the switch button and activates the function of the circuit on the printed circuit board when the touchpad is pressed by the user, so that a relation of absolute coordinate exists between the touchpad and the cursor on the screen, and wherein the cursor on the screen jumps to a corresponding position when the user touches any part of the touchpad.

2. The device as claimed in Claim 1, wherein the touchpad further has a bus line, connected to a main board of the electronic product and capable of moving the cursor on the screen as the touchpad is touched by the user's finger and the finger slides thereon.

3. The device as claimed in Claim 1, wherein the protruberance is connected to a rear surface of a flat plate, and the flat plate is used to carry the touchpad and has wedge openings on its edges.

4. The device as claimed in Claim 3, wherein a window cover is further provided above the touchpad to wrap and fix the touchpad and expose an upper surface of the touchpad, and the window cover has wedge hooks on edges, capable of hooking the wedge openings of the flat plate, so that the touchpad is fixed between the window cover and the flat plate.

5. The device as claimed in Claim 1, further comprising an elastic recovery device, installed beneath the touchpad, wherein when pressure exerted on the touchpad disappears, the elastic recovery device lifts the touchpad upwards, so the protruberance leaves the switch button, and the function of the circuit on the printed circuit board is stopped, so that the touchpad and the cursor on the screen recover the relation of relative coordinate, and when the user touches the touchpad and moves his finger thereon, the cursor on the screen moves proportionately.

6. The device as claimed in Claim 1, wherein the digital electronic product comprises a notebook computer.

7. The device as claimed in Claim 1, wherein the digital electronic product comprises a personal digital assistant (PDA).

8. The device as claimed in Claim 1, wherein the digital electronic product comprises an electronic dictionary.

9. A touchpad device installed on an electronic product for processing digital information, for a user to move a cursor on a screen to a destination position by touching the touchpad, at least comprising:

- a touchpad, having a bus line, connected to a main board of the electronic product and capable of moving the cursor on the screen through the relative coordinate method as the touchpad is touched by the user's finger and the finger is moved thereon;

- a flat plate, for carrying the touchpad, having a protruberance on a rear surface thereof, and having wedge openings on edges thereof;

- a window cover, wrapping above the touchpad and exposing an upper surface of the touchpad, for installing and fixing the touchpad on the electronic product, wherein the window cover has wedge hooks on edges, capable of hooking the wedge openings, so as to fix the touchpad between the window cover and the flat plate;

- a switch button, installed on a printed circuit board, beneath the touchpad, and aligned with the protruberance on the rear surface of the touchpad, wherein when the touchpad is pressed by the user, the flat plate falls accordingly, so the protruberance presses the switch button and activates the function of the circuit on the printed circuit board, so that a relation of absolute coordinate exists between the touch point on the touchpad and the cursor on the screen, and wherein the cursor on the screen jumps to a corresponding position when the user touches any part of the touchpad; and

- an elastic recovery device, installed beneath the flat plate, wherein when pressure exerted on the touchpad disappears, the elastic recovery device lifts the touchpad upwards, so the protruberance leaves the switch button, and the function of the circuit on the printed circuit board is stopped, so that the touchpad and the cursor on the screen recover the relation of relative coordinate, and when the user touches the touchpad and moves his finger thereon, the cursor on the screen moves proportionately.

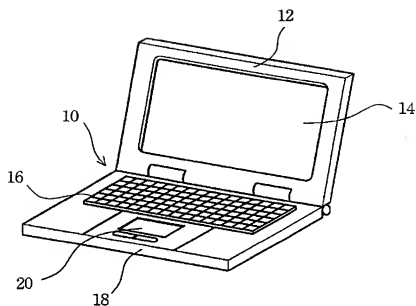


FIG. 1

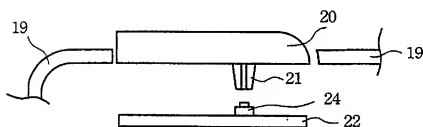


FIG. 2

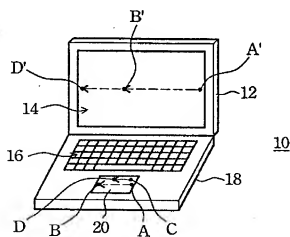


FIG. 3

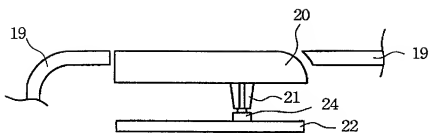


FIG. 4

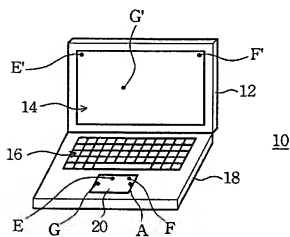


FIG. 5

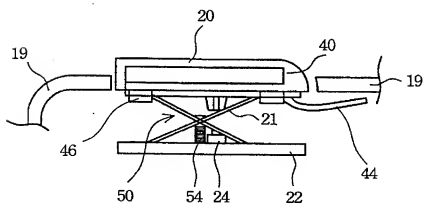
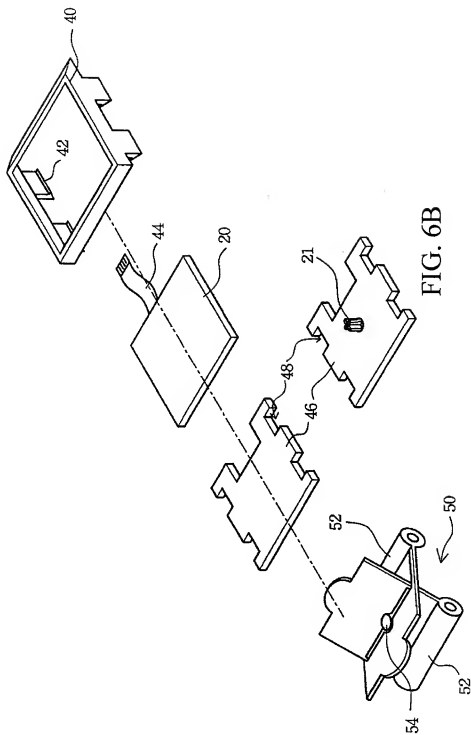


FIG. 7



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(以上各欄由本局填註)

發明專利說明書

一、發明 名稱	中 文	數位化電子產品之接觸墊裝置
	英 文	
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四、中文創作摘要（創作之名稱：）

數位化電子產品之接觸墊裝置

創作摘要：

一種裝設於筆記型電腦上之接觸墊裝置，用以移動螢幕上的游標。此接觸墊裝置包含一接觸墊，藉著操作者手指觸摸接觸墊，可使位於螢幕上之游標，以相對座標方式移動。其中在接觸墊下方並具有一凸起物。另外，一切換鈕，裝設於印刷電路板上，且位於接觸墊下方。當接觸墊被操作者壓下時，凸起物會按壓切換鈕，而啟動印刷電路板上電路之功能，使接觸墊與螢幕游標具有絕對座標的對應關係。當操作者觸碰接觸墊上之任何一點時，螢幕上之游標會跳至對應的位置。

英文創作摘要（創作之名稱：）

五、創作說明()

創作領域：

本創作與一種裝設於電子產品上之接觸墊裝置有關，特別是關於一種裝設於筆記型電腦上的接觸墊裝置，用以使操作者藉著碰觸筆記型電腦之接觸墊，而以相對座標與絕對座標方式，來控制螢幕上之游標。

創作背景：

隨著電子科技日新月異的進步，在追求輕便性與實用性的考量下，目前市面上的電子產品一般都趨向於做成輕、薄、短、小，以符合現代社會之生活方式。其中，筆記型電腦就是一個很典型的例子，其它如攜帶型之掃描器及攜帶型之收錄音機，甚至在目前極為流行之電子記事簿(Personal Digital Assistant, PDA)或電子字典…等等均由於其具有處理大量數位化資訊之強大功能，而受到社會大眾的喜愛與廣泛應用。

請參照第一圖，該圖顯示了目前廣泛使用之筆記型電腦 10。其中，如同所熟知，此筆記型電腦 10 具有連接於主機部份 18 邊緣之上蓋 12，且在此上蓋 12 上具有螢幕 14，而在主機部份 18 表面上，則具有鍵盤部份 16，以便進行輸入等動作，而進行操作功能。值得注意的是，為了滿足筆記型電腦利於攜帶的特性，傳統桌上型電腦所使用之相關附件，如鍵盤、滑鼠或數據機皆以適當的方式，

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五、創作說明()

裝設於筆記型電腦中。例如，一般的筆記型電腦 10 往往使用接觸墊 20 的方式，來取代滑鼠而達到控制螢幕上游標的目的。

然而，對習慣於使用桌上型電腦的人而言，在使用筆記型電腦時，往往會對以手指碰觸接觸墊 20 來移動螢幕游標的方式感到不適應。主要原因是操作者的手指移動距離與螢幕上游標的移動距離，其間的比例相差甚大。亦即，在以接觸墊 20 控制螢幕 14 上的游標時，其靈敏度相當大。是以當欲使游標在螢幕 14 上移動較小一段距離時，操作者之手指僅能觸碰接觸墊 20 且輕微的移動，否則往往會使螢幕游標移動過多。然而，如果為了使操作者可隨心所欲的控制螢幕游標，而將螢幕游標的靈敏度降低(亦即將接觸墊與螢幕游標的對應比例調低)，則在操作者欲使螢幕游標移動較大距離時，往往又需要以手指碰觸接觸墊 20，且來回移動數次，才可使游標到達目標。是以，即使在操作者已經習慣於使用筆記型電腦之情形下，此種純粹使用操作者觸摸接觸墊 20 且滑動之距離，再以固定比例驅動螢幕游標移動對應距離的相對座標方式，依舊會造成相當程度的不便。

創作目的及概述：

本創作之主要目的在提供一種可以絕對座標方式之接觸墊裝置，在操作者按壓接觸墊時，即可根據按壓的

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五、創作說明()

位置，而立即將螢幕游標跳至相對應的位置上。

本創作之另一目的在提供一種可藉著按壓接觸墊，來改變接觸墊與螢幕游標間對應關係之接觸墊裝置。

本創作提供一種裝設於筆記型電腦上之接觸墊裝置。藉著操作者以手指觸碰接觸墊，可以絕對座標方式或相對座標方式，來移動螢幕上之游標。其中，此接觸墊裝置包括了一接觸墊，且此接觸墊以一匯流排線，而連接至筆記型電腦主機板。另外，一平板，位於接觸墊下方，用以承載接觸墊。其中，在平板之下表面，具有一凸起物，且在平板邊緣具有四個楔型開口。並且，一窗型蓋，可裝設於接觸墊上方，並曝露出接觸墊之上表面。其中窗型蓋邊緣具有四個楔形鉤，可分別卡住四個楔型開口，而將接觸墊固定於窗型蓋與平板間。此外，一切換鈕，裝設於印刷電路板上，且位於平板下方，此切換鈕正好對準平板下表面之凸起物。當接觸墊受到壓力而向下降時，此平板亦隨著下降，而使凸起物按壓切換鈕，並啟動該印刷電路板上電路之功能。如此，可使接觸墊上的碰觸點與螢幕上的游標具有絕對座標的對應關係。亦即，當觸碰接觸墊上任意一點時，螢幕上之游標會跳至對應的位置上。並且，可裝設一彈性回復裝置於平板下方，以便當接觸墊所受壓力消失時，彈性回復裝置可將平板向上托起，而使凸起物離開切換鈕，並停止印刷電路板上電路之功能，使接觸墊上的碰觸點與螢幕上的游標具有相對座標的對應關係。亦即，

(請先閱讀背面之注意事項再填寫本頁)

裝

訂

檢

五、創作說明()

當觸碰接觸墊且移動時，螢幕上之游標會相對的移動。

圖式簡單說明：

藉由以下詳細之描述結合所附圖示，將可輕易的了解上述內容及此項創作之諸多優點，其中：

第一圖顯示目前廣泛使用之筆記型電腦其裝置圖；

第二圖顯示根據本創作所提供可裝設於筆記型電腦上之接觸墊裝置截面圖，其中接觸墊未被壓下，而未按壓位於電路板上之切換鈕；

第三圖顯示在未將接觸墊壓下而按壓切換鈕時，螢幕上游標，會根據操作者手指碰觸接觸墊之方式，而以相對座標進行移動；

第四圖顯示根據本創作所提供可裝設於筆記型電腦上之接觸墊裝置截面圖，其中接觸墊被下壓而按壓切換鈕；

第五圖顯示在將接觸墊壓下而按壓切換鈕時，螢幕上游標，會根據操作者手指碰觸接觸墊之方式，而以絕對座標進行移動；

第六A、B圖顯示根據本創作所提供實施例，裝設於筆記型電腦上之接觸墊裝置爆炸圖；及

第七圖顯示根據本創作所提供可裝設於筆記型電腦上之接觸墊裝置截面圖。

圖示對照說明：

(請先閱讀背面之注意事項再填寫本頁)

裝

訂

線

五、創作說明()

- | | |
|----------|-----------|
| 10 筆記型電腦 | 12 上蓋 |
| 14 螢幕 | 16 鍵盤 |
| 18 主機部份 | 19 上蓋 |
| 20 接觸墊 | 21 凸起物 |
| 22 印刷電路板 | 24 切換鈕 |
| 40 窗型蓋 | 42 楔形鉤 |
| 44 匯流排線 | 46 平板 |
| 48 楔形開口 | 50 彈性回復裝置 |
| 52 薄板 | 54 彈簧柱 |

創作詳細說明：

本創作提供一種接觸墊裝置，可切換螢幕游標之控制方式，以絕對座標或相對座標來移動螢幕游標。藉著在接觸墊下方裝設一凸起物，在操作者下壓接觸墊時，將可使凸起物按壓切換鈕而啟動印刷電路板上電路之功能，而轉換為以絕對座標的方式來控制螢幕游標。有關本創作之詳細說明如下所述。

首先，請參照第二圖，該圖顯示根據本創作所提供裝設於筆記型電腦上之接觸墊裝置。其中，接觸墊 20 乃以鑲嵌方式，裝設於筆記型電腦其主機部份的外殼 19 上(請參見第一圖)。此接觸墊 20，如同上述，是以相對座標的方式來控制螢幕上之游標。亦即，藉著操作者以手指在

(請先閱讀背面之注意事項再填寫本頁)

裝

訂

線

五、創作說明()

接觸墊 20 上表面滑動，可使螢幕上之游標，以相對的固定比例移動。值得注意的是在此接觸墊 20 下表面，加裝了一凸起物 21，以便在操作者按壓接觸墊 20 時，可切換並控制接觸墊 20 與螢幕間之關係。

另外，提供一印刷電路板 22，且裝設於此接觸墊 20 之下方。此印刷電路板 22，主要用於切換接觸墊 20 與螢幕游標間之控制關係，使其可在相對座標與絕對座標方式間切換。值得注意的是在此印刷電路板 22 上，對準接觸墊 20 其凸起物 21 的位置，並裝設了一切換鈕 24。其中，當接觸墊 20 被操作者壓下時，凸起物 21 會按壓切換鈕 24，而啟動印刷電路板 22 上電路之功能，使接觸墊與螢幕游標間，具有絕對座標的對應關係。反之，則如第二圖所示，當操作者未按壓接觸墊 20 時，其下凸起物 21 並不會按壓切換鈕 24，此時接觸墊與螢幕游標間，則具有相對座標的對應關係。

請參照第三圖，此圖中顯示了接觸墊 20 與螢幕游標間，以相對座標方式進行控制之情形。其中，當操作者之手指，碰觸著接觸墊 20 且由點 A 滑動至點 B 時，螢幕上之游標會以相當的比例，進行相對的移動，例如從點 A' 移動至點 B'。此時，當操作者手指移開接觸墊 20，且再碰觸接觸墊 20 並由點 C 滑動至點 D 時，位於螢幕上之游標會從點 B'，以相當的比例，移動至點 D' 的位置。換言之，當操作者欲再度移動螢幕游標時，可再觸摸接觸墊 20，使螢

(請先閱讀背面之注意事項再填寫本頁)

裝

訂

線

五、創作說明()

幕游標由點D'移動至所需的目的地。

然而，如第四圖所示，當操作者欲更換螢幕游標移動方式，由相對座標至絕對座標方式時，則可輕壓接觸墊20，藉著使接觸墊20下降，而使其下方的凸起物21，按壓位於印刷電路板22上之切換鈕24，而啟動此印刷電路板22上電路之功能。此時，螢幕游標與接觸墊20間將具有絕對座標的控制方式。亦即，當操作者觸碰接觸墊上之任何一點時，游標會立即跳至螢幕上對應的位置。如第五圖所示，當操作者在壓下接觸墊20的同時，手指是觸碰在接觸墊20左上角的點E時，螢幕游標會立即跳至螢幕14左上角相對應的點E'處。當操作者欲移動螢幕游標至螢幕14右上角的點F'時，則可在壓下接觸墊20的同時，手指觸碰於接觸墊20的右上角點F'，即可達成目的。同樣的，不論螢幕游標在螢幕14上任何位置時，祇要按壓接觸墊20之中央點G，皆可立刻使螢幕游標跳至螢幕中央的點G'處。亦即，當以絕對座標方式，來控制螢幕游標時，螢幕上的任何位置，皆可對應至接觸墊20上相同位置，而輕鬆的達到移動螢幕游標至目的地之需求。

接著，請參照第六A圖，此圖顯示了根據本創作所提供實施例，裝設於筆記型電腦10上的接觸墊裝置爆炸圖。其中，該接觸墊裝置包括了上述之接觸墊20，且此接觸墊20具有一匯流排線44，用以連接至筆記型電腦10的主機板。至於在此接觸墊20下方，則提供了一平板46，

(請先閱讀背面之注意事項再填寫本頁)

裝

訂

線

五、創作說明 ()

用以承載接觸墊 20，其中在此平板 46 之邊緣上，分別形成了四個楔型開口 48，可用以固定接觸墊 20。值得注意的是，如第六 B 圖所示，在此平板 46 之下表面，具有一凸起物 21，以便操作者可用來切換控制螢幕游標之方式。

仍請參照第六 A 圖，在接觸墊 20 之上方，則提供了一窗型蓋 40，用以覆蓋於接觸墊 20 之邊緣部份上，且曝露出接觸墊 20 之上表面。其中，此窗型蓋 40 邊緣，具有四個楔形鉤 42，分別對應至平板 46 之四個楔型開口 48。當兩者扣合時，可將接觸墊 20 固定於窗型蓋 40 與平板 46 之間。另外，一彈性回復裝置 50，裝設於平板 46 下方，以便當接觸墊 20 所受壓力消失時，彈性回復裝置 50 可將平板 46 向上托起，而使凸起物 21 離開切換鈕 24，並停止印刷電路板 22 上電路之功能。並使接觸墊 20 上的碰觸點，與螢幕上的游標回復至相對座標的對應關係。在一較佳實施例中，可使用如第六 A 圖中所示之橋式結構來作為上述之彈性回復裝置 50。其中，此橋式結構包括了兩片彼此交叉的薄板 52，且藉著通過此兩片薄板 52 之彈簧柱 54，將其固定住。

如此，可得到如第七圖中所示之接觸墊裝置。其中，可將由窗型蓋 40 與平板 46 所包覆之接觸墊 20，裝設於筆記型電腦 10 其主機部份的外殼 19 上。且上述連接接觸墊 20 之匯流排線 44，可自平板前端的空隙拉出，而連接至筆記型電腦 10 之主機板。至於，在平板 46 與印刷

(請先閱讀背面之注意事項再填寫本頁)

裝

訂

線

五、創作說明()

電路板 22 間，則裝設了上述橋式結構之彈性回復裝置 50。當操作者欲以絕對座標來控制螢幕游標時，可將接觸墊 20 下壓，而使得平板 46 下方的凸起物 21，按壓至切換鈕 24，而啟動印刷電路板 22 上電路之功能。相對的，當操作者已將螢幕游標移動至所要的位置時，在其鬆放接觸墊 20 時，彈簧柱 54 會將使橋式結構彈回原來的形狀，而使平板 46 向上移動，並使凸起物 21 離開切換鈕 24。如此，當操作者不將接觸墊 20 下壓，而以手指在其上進行觸摸與滑動時，螢幕游標將再度以相對座標的方式進行移動。

由此，藉著將接觸墊下壓或鬆放來控制接觸墊與螢幕游標間的控制方式，可大幅昇操作者使用接觸墊控制螢幕游標之能力。對不習慣使用筆記型電腦的操作者而言，由於可藉著將接觸墊下壓，而採用絕對座標方式來移動螢幕上的游標，是以可在移動游標至螢幕上大概的位置後，再鬆放接觸墊，而採用相對座標方式來移動螢幕上的游標。特別是，由於可以絕對座標方式，將游標直接跳至所要的位置，是以在設計相對座標的比例時，將可降低接觸墊與螢幕游標間之比例關係。亦即，可降低螢幕游標之靈敏度，而使操作者在以觸摸接觸墊來控制螢幕游標時，可以更隨心所欲的移動螢幕游標至目的地。另外，要特別說明的是，在本創作的實施例中，雖然僅列舉了筆記型電腦來作為說明。但對熟悉是項技術人士，當知此滑動機構，可應用於任何一種數位化電子產品上。例如可應用於電子

(請先閱讀背面之注意事項再填寫本頁)

裝

訂

線

五、創作說明()

記事簿(Personal Digital Assistant, PDA)、電子辭典…等
等產品。

本創作雖以較佳實例闡明如上，然其並非用以限定
本創作精神與創作實體，僅止於上述之實施例爾。是以對
熟悉此領域技藝者，在不脫離本創作之精神與範圍內所作
之修改，均應包含在下述之申請專利範圍內。

(請先閱讀背面之注意事項再填寫本頁)

裝

訂

線

六、申請專利範圍

申請專利範圍：

1. 一種裝設於用來處理數位化資料之電子產品上的接觸墊裝置，藉著觸碰接觸墊可移動螢幕上之游標，該接觸墊裝置至少包含：

接觸墊，位於該電子產品上，可藉著操作者手指觸碰該接觸墊且於其上移動，而使位螢幕游標，以相對座標方式進行對應的移動，其中該接觸墊下表面並具有一凸起物；及

切換鈕，裝設於一印刷電路板上，且位於該接觸墊下方，該切換鈕並對準該接觸墊之凸起物，當該接觸墊被操作者壓下時，該凸起物會按壓該切換鈕，而啟動該印刷電路板上電路之功能，使該接觸墊與該螢幕游標具有絕對座標的對應關係，當操作者觸碰該接觸墊上之任何一點時，該螢幕游標會跳至對應的位置。

2. 如申請專利範圍第 1 項之裝置，其中上述之接觸墊，更具有一匯流排線，以連接至該電子產品之主機板，並且在操作者以手指觸碰該接觸墊且滑動時，可使該螢幕游標移動。

3. 如申請專利範圍第 1 項之裝置，其中上述之凸起物乃連接於一平板之下表面，且該平板用以承載該接觸墊，且其邊緣具有楔型開口。

(請先閱讀背面之注意事項再填寫本頁)

裝

訂

線

六、申請專利範圍

4. 如申請專利範圍第 3 項之裝置，其中在上述接觸墊上方，更具有一窗型蓋，用以包覆並固定該接觸墊且曝露出該接觸墊上表面，其中該窗型蓋邊緣具有楔形鉤，可卡住該平板之楔型開口，而將該接觸墊固定於該窗型蓋與該平板間。

5. 如申請專利範圍第 1 項之裝置，其中更包括一彈性回復裝置，裝設於該接觸墊下方，當該接觸墊所受壓力消失時，該彈性回復裝置可將該接觸墊向上托起，而使該凸起物離開該切換鈕，並停止該印刷電路板上電路之功能，使該接觸墊與該螢幕游標，恢復相對座標的對應關係，其中當操作者觸碰該接觸墊且移動時，該螢幕游標會相對移動。

6. 如申請專利範圍第 1 項之裝置，其中上述之數位化電子產品包括筆記型電腦 (Notebook)。

7. 如申請專利範圍第 1 項之裝置，其中上述之數位化電子產品包括個人電子記事簿 (Personal Digital Assistant, PDA)。

8. 如申請專利範圍第 1 項之裝置，其中上述之數位化電子產品包括電子辭典。

9. 一種裝設於用來處理數位化資料之電子產品上

六、申請專利範圍

的接觸墊裝置，以提供操作者藉著觸碰接觸墊，而移動螢幕上之游標至目標位置，該接觸墊裝置至少包含：

接觸墊，具有一匯流排線，以連接至該電子產品之主機板，並且在操作者以手指觸碰該接觸墊且移動時，可使螢幕游標，以相對座標方式移動；

平板，用以承載該接觸墊，該平板下表面並具有一凸起物，且該平板邊緣具有楔型開口；

窗型蓋，包覆於該接觸墊上方且曝露出該接觸墊上表面，用以裝設並固定該接觸墊於該電子產品上，其中該窗型蓋邊緣具有楔形鉤，可卡住該楔型開口，而固定該接觸墊於該窗型蓋與該平板之間；

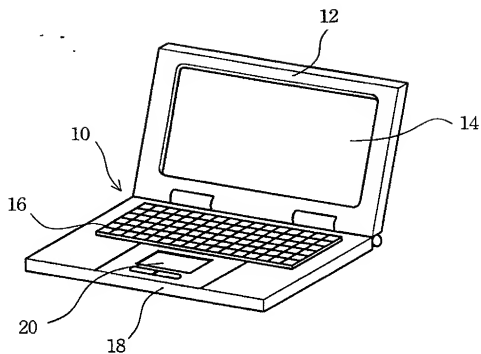
切換鈕，裝設於一印刷電路板上，且位於該平板下方，該切換鈕對準該平板下表面之該凸起物，當該接觸墊被操作者壓下時，該平板亦會隨之下降，而使該凸起物按壓該切換鈕，並啟動該印刷電路板上電路之功能，使該接觸墊上的碰觸點與該螢幕游標，產生絕對座標的對應關係，其中當操作者觸碰該接觸墊上之任一點時，該螢幕游標會跳至相對應的位置上；及

彈性回復裝置，裝設於該平板下方，當該接觸墊所受壓力消失時，該彈性回復裝置可將該平板向上托起，而使該凸起物離開該切換鈕，並停止該印刷電路板上電路之功能，使該接觸墊與該螢幕游標，恢復相對座標的對應關係，其中當操作者觸碰該接觸墊且移動時，該螢幕游標會相對的移動。

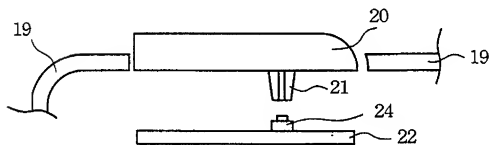
(請先閱讀背面之注意事項再填寫本頁)

訂

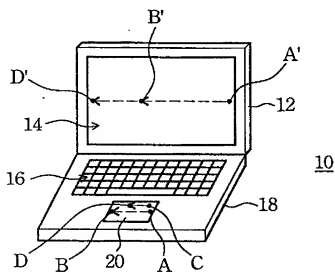
線



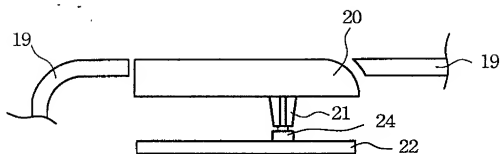
第一圖



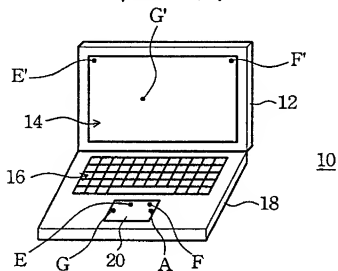
第二圖



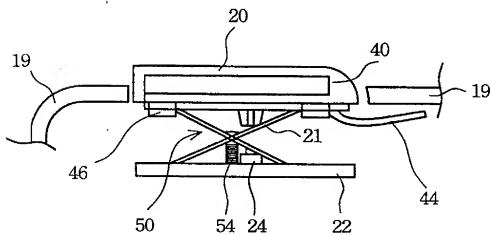
第三圖



第四圖



第五圖



第七圖

